Course guide
240379 - 240IQU40 - Natural Resources and Waste Management Optimization for Food Products and Packages

Last modified: 16/05/2023

Unit in charge: Barcelona School of Industrial Engineering
Teaching unit: 713 - EQ - Department of Chemical Engineering.

Degree: MASTER'S DEGREE IN INDUSTRIAL ENGINEERING (Syllabus 2014). (Optional subject).

Academic year: 2023 **ECTS Credits:** 4.5 **Languages:** Spanish, English

LECTURER

Coordinating lecturer: María Pilar Almajano

Others:

TEACHING METHODOLOGY

Active lecture classes
Visits to companies in the food sector
Laboratory practices
Scientific debates
Analysis of scientific articles
Attendance to congresses "online"

LEARNING OBJECTIVES OF THE SUBJECT

At the end of the course students will be able to:
1. Establish a quality system of a food company
2. Defend, scientifically, the need (or not) of additives in food
3. Carry out a reasoned report of food-chemical laboratory practices
4. Make a calculation of the carbon footprint of food production
5. Explain the different types of containers and their properties
6. Analyze the different methodologies for the extraction of antioxidants from natural products as well as their chemical characterization
7. Make a presentation of a scientific article

STUDY LOAD

Type	Hours	Percentage
Hours large group	40,5	36.00
Self study	72,0	64.00

Total learning time: 112.5 h

CONTENTS

Food from a chemical and environmental point of view

Description:
The need to eat is undeniable. But is the current situation environmentally sustainable? What kind of interventions can be done to be more respectful with the environment?

Related activities:
Active lecture classes
Analysis of scientific papers

Full-or-part-time: 13h
Practical classes: 5h
Guided activities: 2h
Self study : 6h

Possible processes of food spoilage depending on their origin.

Description:
Oxidative and microbiological deterioration will be analyzed, as well as possible barriers to minimize them

Full-or-part-time: 12h
Practical classes: 4h
Laboratory classes: 2h
Guided activities: 1h
Self study : 5h

Food and environmental conservation methodologies. Carbon footprint. Circular economy.

Description:
Current food preservation methodologies and their impact on the environment will be described. They will teach how to calculate the carbon footprint.

Full-or-part-time: 13h
Practical classes: 4h
Laboratory classes: 2h
Guided activities: 2h
Self study : 5h

Containers and packaging: analysis of their physical and chemical properties. Particular cases of biodegradable packaging.

Description:
The need for packaging to protect food and waste generated, as well as the management of this waste will be analyzed

Full-or-part-time: 11h
Practical classes: 4h
Guided activities: 2h
Self study : 5h

Use of waste to obtain natural antioxidants. Optimization of the different extraction parameters.

Description:
The scientific foundations of the optimization of parameters to obtain antioxidants from food waste without added value will be explained.

Full-or-part-time: 10h
Practical classes: 3h
Laboratory classes: 1h
Guided activities: 2h
Self study : 4h

Allergies, intolerances, deficits, GMOs, ... what are they, what risks do we have?

Description:
Informative aspects will be worked on scientifically, so that students are able to have an opinion based on experimental facts.

Full-or-part-time: 11h
Practical classes: 5h
Guided activities: 2h
Self study : 4h

GRADING SYSTEM

0.1 * active participation in the classes + 0.15 * visit reports + 0.15 * reasoned reports of the practices + 0.15 * work on a scientific article + 0.05 * debate (preparation and participation) + 0, 4 * final exam of key concepts

RESOURCES

Audiovisual material:
- Nombre recurso. Resource

Other resources:
There is no specific bibliography, since it will work mainly with scientific publications and congresses online